PIONEER®

Service Manual

CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS

ORDER NO.
ARP-100-0

STEREO AMPLIFIER

SA-930

MODEL SA-930 COMES IN SEVEN VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KU	AC 120V only	U.S.A. model
S	AC 110V, 120V, 220V and 240V (Switchable)	General export model
S/G	AC 110V, 120V, 220V and 240V (Switchable)	U.S. Military model
YP	AC 240V only	Australia model
HE	AC 220V and 240V (Switchable)	Europe model
HB	AC 220V and 240V (Switchable)	United Kingdom model
HEZ	AC 220V and 240V (Switchable)	West Germany model

- **This service manual is applicable to the KU type. When repairing the S, S/G, YP, HE, HB and HEZ types, please see (page 24~31).**
- **Ce manuel d'instruction se refère au mode de réglage, en fançais.**
- **Este manual de servicio trata del método de ajuste escrito en español.**

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1. SPECIFICATIONS

Amplifier Section

Continuous average power output is 70 watts* per channel, min., at 8 ohms from 20 hertz to 20,000 hertz with no more than 0.04% total harmonic distortion.

Total Harmonic Distortion (20Hz to 20,000Hz, 8 ohms, from AUX/VIDEO)
35 watts per channel power output . No more than 0.02%
Intermodulation Distortion . (50Hz : 7,000Hz = 4 : 1, 8 ohms, from AUX/VIDEO)
Continuous rated power output . . No more than 0.04%
35 watts per channel power output
. . . . . No more than 0.02%
Damping Factor (20Hz to 20,000Hz, 8 ohms) 40
Input (Sensitivity/Impedance)
PHONO . . . . . 2.5mV/50 kilohms
TUNER . . . . . 150mV/50 kilohms
AUX/VIDEO . . . . . 150mV/50 kilohms
TAPE PLAY 1,2/ADAPTOR . . . . 150mV/50 kilohms
Phono Overload Level (T.H.D. 0.01%, 1,000Hz)
PHONO 150mV
Output (Level)
TAPE REC 1,2/ADAPTOR 150mV
Speaker . . . . . A, B, A+B, OFF
Frequency Response
PHONO (RIAA Equalization)
. . . . . 20Hz to 20,000Hz ±0.5dB
TUNER, AUX/VIDEO, TAPE PLAY 1,2/ADAPTOR
. . . . . .10Hz to 100,000Hz ±3dB
Tone Control
BASS . . . . . ±10dB (100Hz)
TREBLE . . . . . ±10dB (10,000Hz)
Subsonic Filter . . . . . 15Hz (-6dB/oct)
Loudness Contour
(Volume control set at -40dB position) . . . +6dB (100Hz)
Hum and Noise (IHF, short-circuited, A network)
PHONO 72dB
TUNER, AUX/VIDEO, TAPE PLAY 1,2/ADAPTOR
. . . . . 97 dB

Miscellaneous

Power Requirements . . . . . AC 120V, 60Hz
Power Consumption . . . . . 170W (UL)
Dimensions . . . . . 420(W) x 97(H) x 275(D) mm
16-9/16(W) x 3-13/16(H) x 10-13/16(D) in
Weight (without package) . . . . . 6.3kg (13 lb 14oz)

Furnished Parts

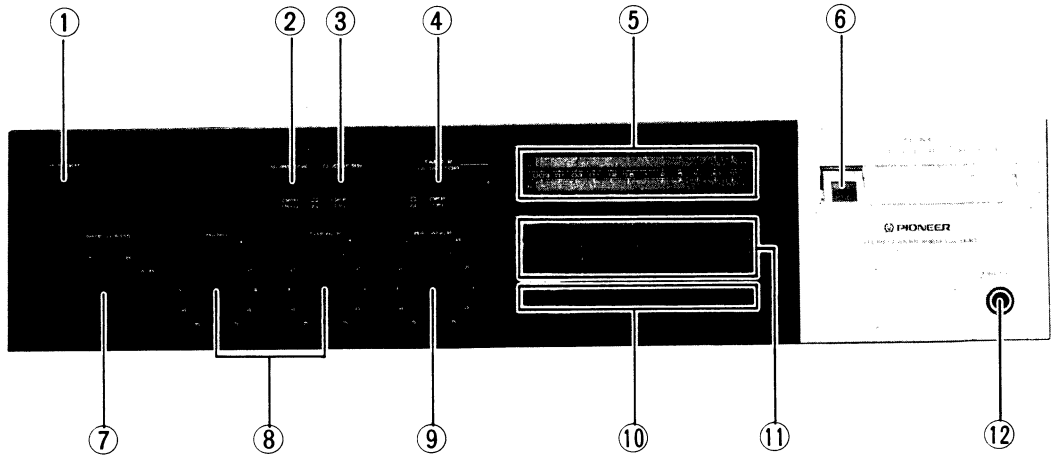
Operating Instructions 1

NOTE:

Specifications and the design subject to possible modifications without notice due to improvements.

** Measured pursuant to the Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifiers.*

2. FRONT PANEL FACILITIES



① POWER SWITCH

Push this switch to turn on or turn off power.

② SUBSONIC SWITCH

Set this switch to the "15Hz" position when listening to records. It serves to attenuate frequencies lower than 15Hz and, therefore, it can be used to suppress the ultra-low-range noise which is generated by record warp and other factors. When listening to program sources other than records, set this switch to OFF.

③ LOUDNESS SWITCH

Set this switch to ON when listening at low volume, bass will be emphasized to compensate for human listening characteristics and provide natural listening curve.

④ TAPE 2/ADAPTOR SWITCH

Set this switch to ON when using a graphic equalizer or a second tape deck (or any equipment) connected to the TAPE 2/ADAPTOR terminals.

⑤ POWER METER

The power meter shows the output level in watts when speaker systems with a nominal impedance of 8 ohms have been connected to the speaker terminals of this unit.

⑥ VOLUME CONTROL

Slide this control to adjust the output level of the speakers and the headphones. Output is minimum at 0 and increases as the control is slided rightward.

⑦ SPEAKERS SELECTOR

Use this selector to select the speaker system.

OFF : Use this setting when listening through headphones (no sound comes out of the speakers.)

A : Sound is heard from speakers connected to the A speaker terminals.

B : Sound is heard from speakers connected to the B speaker terminals.

A+B : Sound is heard from speakers connected to both A and B speaker terminals.

⑧ BASS AND TREBLE CONTROLS

Use these controls to adjust the tone. The right one controls treble and the left one controls bass. Turning knob clockwise accentuates the bass or treble, and turning counterclockwise attenuates the bass or treble.

⑨ BALANCE CONTROL

This control should normally be set to the center position. When the output from the left and right speakers or headphones is not the same, adjust by turning the control clockwise or counterclockwise.

⑩ FUNCTION SWITCHES

The function is automatically switched when the unit is used in combination with PIONEER's TX-930, CT-930, PL-730 or other unit equipped with AUTO FUNCTION terminals. This function itself is used when the unit is hooked up with other stereo components.

TUNER : Push when listening to a broadcast on the tuner which you have connected to the rear panel TUNER terminals.

PHONO : Push when playing records on the turntable which you have connected to the rear panel PHONO terminals.

TAPE 1 : Push when playing back tapes on a tape deck which you connected to the rear panel TAPE1 terminals.

AUX/VIDEO: Push when using a component which you have connected to the rear panel AUX/VIDEO terminals.

The TUNER function is selected when the power is switched on. When a timer is used and a tape deck set up for automatic tape playback, the TAPE function is selected when the power is switched on.

⑪ FUNCTION INDICATORS

These indicate the function switch positions.
When the function is selected in cases where a turntable is being used, the indicator corresponding to the selected position lights and, at the same time, the PHONO indicator winks to warn that the turntable is still operating.

⑫ HEADPHONE JACK

Plug headphones into this jack for private listening through them. Set the SPEAKERS selector to OFF.

3. DISASSEMBLY PROCEDURES

Front Panel Assembly

1. Remove the bonnet case by unscrewing the three screws on the rear panel.
2. Unscrew the two screws ① holding the front panel assembly in place and remove the four rotary knobs.
3. Press down on the three hooks on the front panel assembly (indicated by the three arrows) with a screwdriver to release the panel holder and lock. Then, gently pull the panel outward. (The bottom of the panel assembly is also locked in three places by hooks, so remove the panel very carefully.)

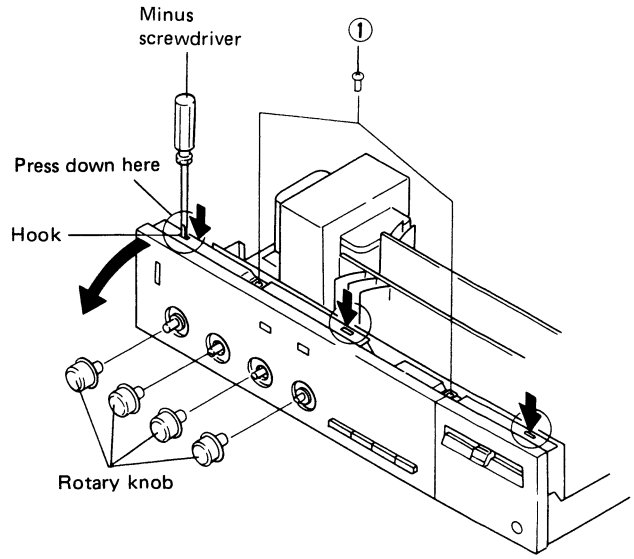


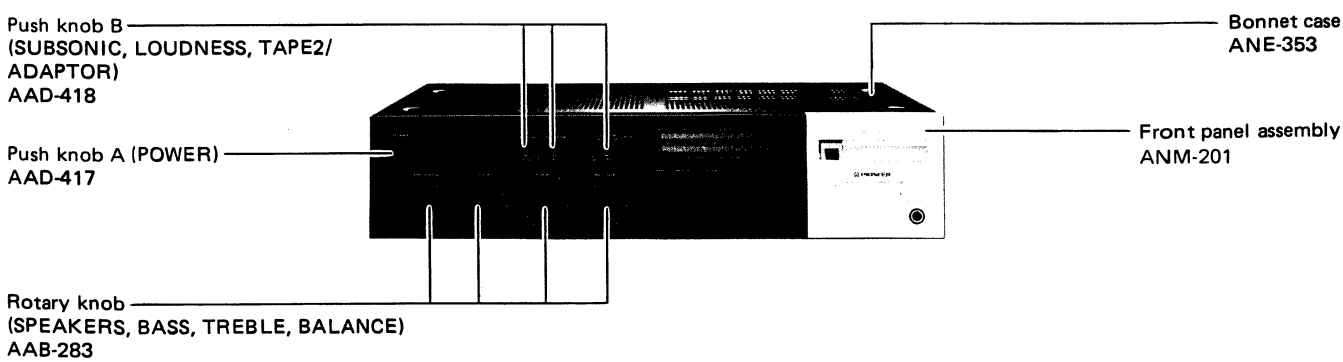
Fig. 5-1 Removing the front panel assembly

4. PARTS LOCATION

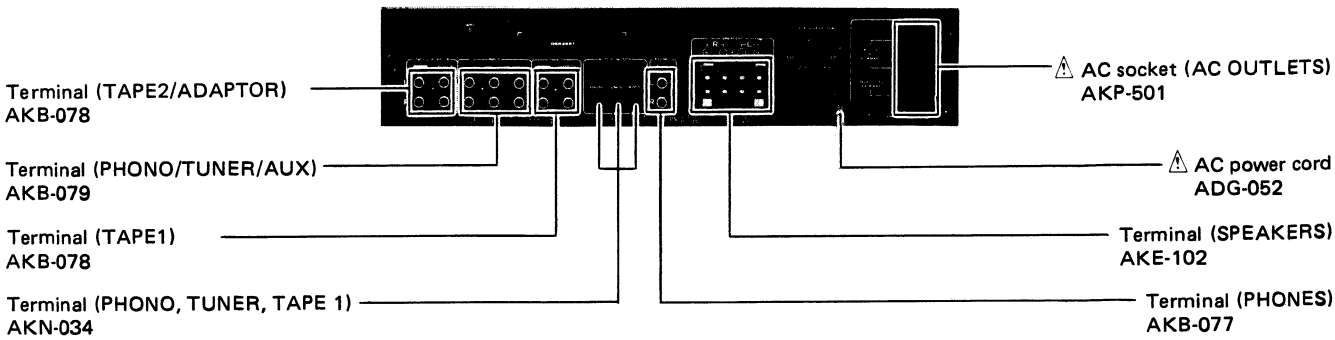
NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

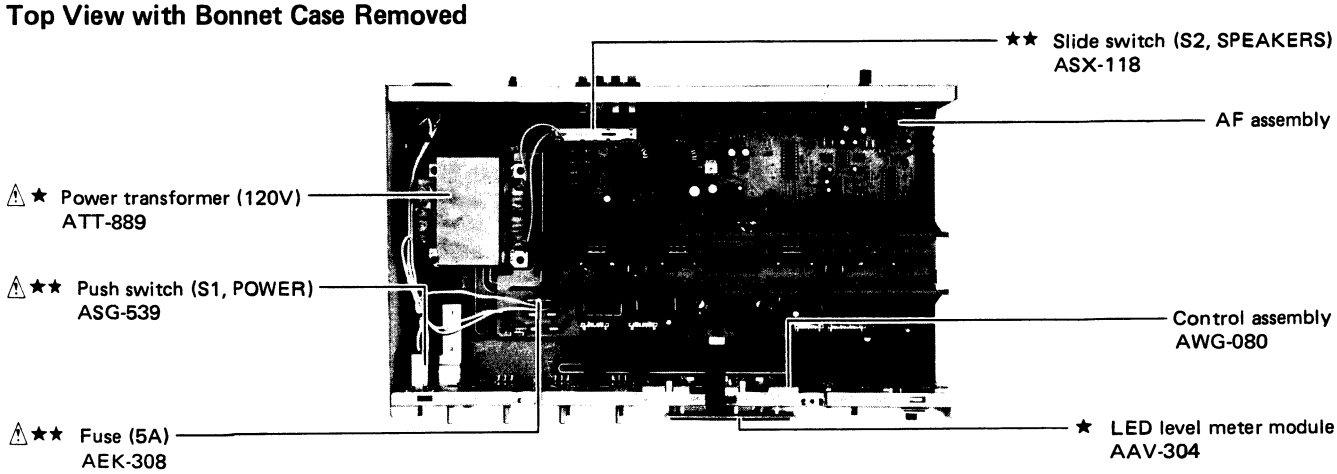
Front Panel



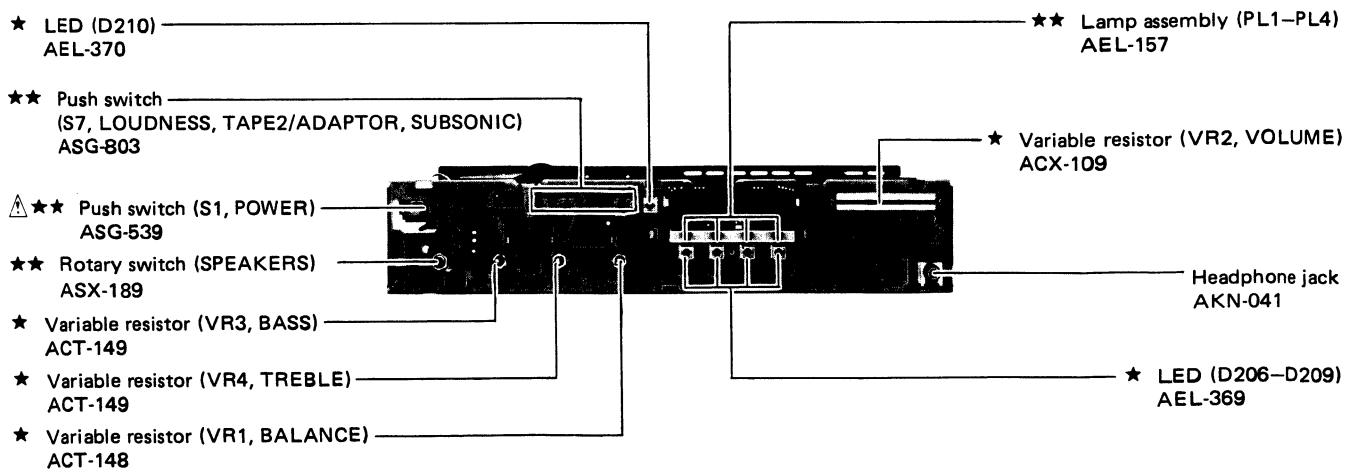
Rear Panel



Top View with Bonnet Case Removed



Front View with Front Panel Removed



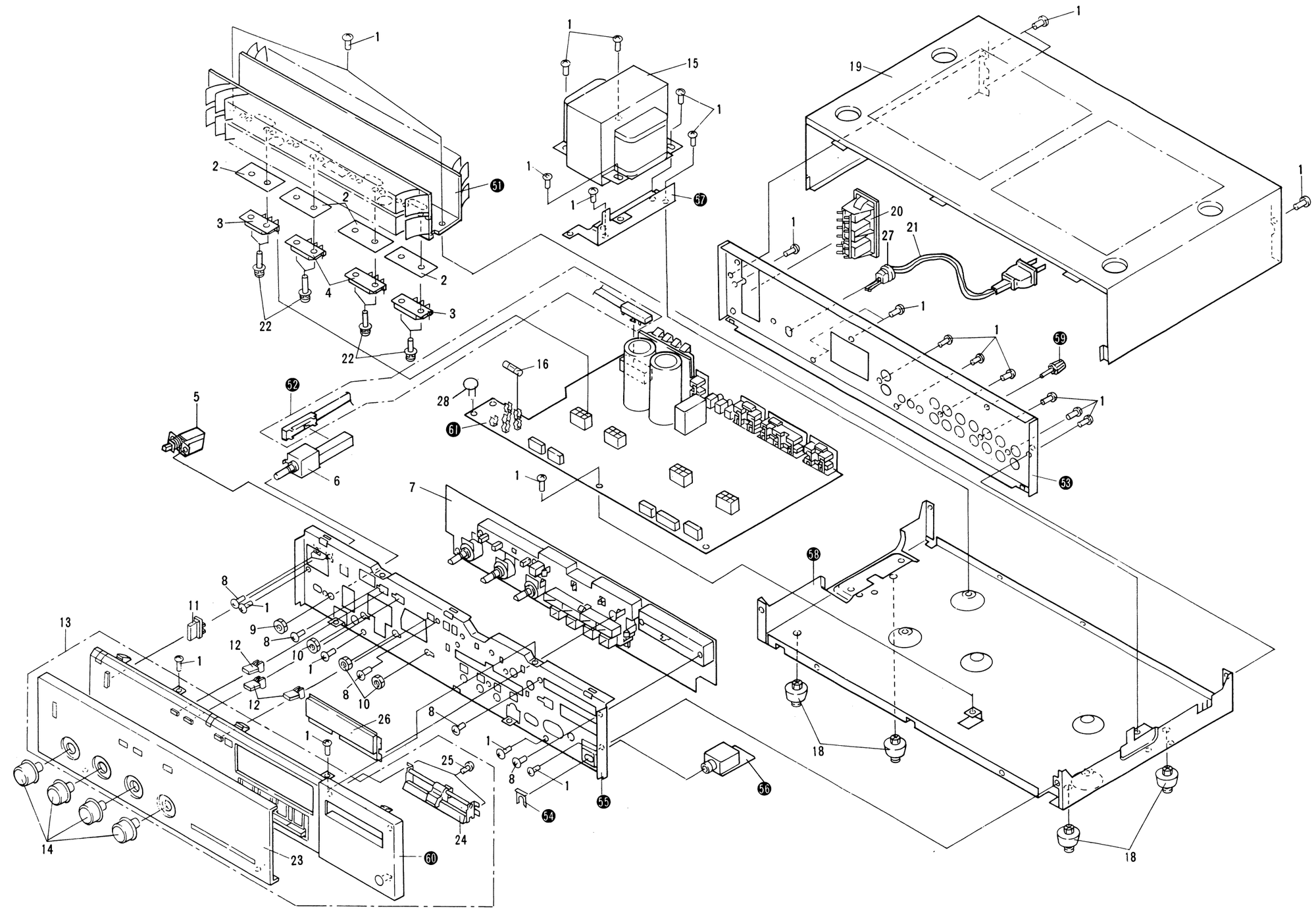
5. EXPLODED VIEW

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Parts List

Mark	No.	Part No.	Description
	1.	BBZ30P080FZK	Screw 3 x 8
	2.	AEC-756	Mica wafer
★★	3.	2SC2525/A/-B* (2SC2525/A/-G)*	Transistor (Q1, Q2)
★★	4.	2SA1075/A/-B* (2SA1075/A/-G)*	Transistor (Q3, Q4)
	* hfe of Q1—Q4 should have the same value.		
⚠ ★★	5.	ASG-539	Push switch (S1, POWER)
★★	6.	ASX-189	Rotary switch
	7.	AWG-080	Control assembly
	8.	PMZ30P060FMC	Screw 3 x 6
	9.	NK90FUC	Nut
	10.	B71-010	Nut M7
	11.	AAD-417	Push knob A (POWER)
	12.	AAD-418	Push knob B (LOUDNESS, SUBSONIC, TAPE2/ADAPTOR)
	13.	ANM-201	Front panel assembly
	14.	AAB-283	Rotary knob (SPEAKERS, BASS, TREBLE, BALANCE)
⚠ ★	15.	ATT-889	Power transformer (T1, 120V)
⚠ ★★	16.	AEK-308	Fuse (FU1, 5A)
	17.	.....	
	18.	AEC-784	Foot assembly
	19.	ANE-353	Bonnet case
⚠	20.	AKP-501	AC socket (AC OUTLETS)
⚠	21.	ADG-052	AC power cord
	22.	ABA-258	Screw ϕ3
	23.	ANM-200	Front panel cover
	24.	ACX-012	Slide knob assembly
	25.	PTZ026P080FMC	Screw 2.6 x 8
★	26.	AAV-304	LED level meter module
	27.	AEC-327	Strain relief
⚠	28.	ACG-017	Ceramic capacitor (C1, 0.01/AC125V)
	51.		Heat sink
	52.		Remote wire
	53.		Rear panel
	54.		Mounting plate
	55.		Panel stay
	56.		Headphones assembly
	57.		Transformer frame
	58.		Chassis
	59.		Terminal (GND)
	60.		Front panel base
	61.		AF assembly


1
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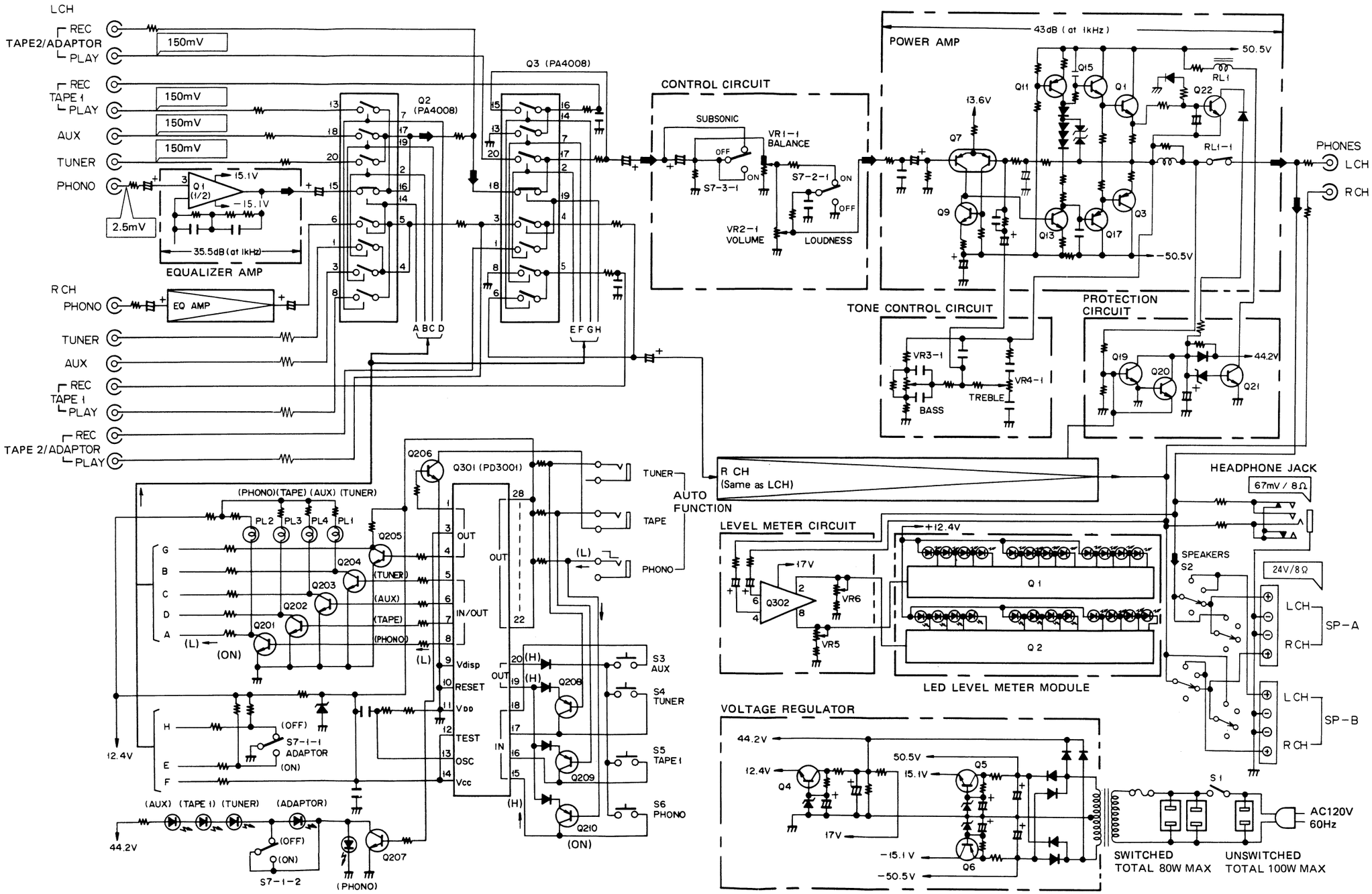
6. BLOCK DIAGRAM



7. CIRCUIT DESCRIPTIONS

7.1 OUTLINE OF CIRCUITS

Equalizer Amplifier

The equalizer amp uses a low-noise IC (NJM 4558DX) that contains both the left and right channel circuits. This IC uses a balanced positive/negative power supply to permit the more than sufficient permissible input level of 150mV (at 1kHz, 0.01%THD).

Tone Control

Tone control is performed by inserting capacitances, resistances and potentiometers in the negative feedback loop of the power amp and thereby changing the amount of negative feedback. The SA-930 also has a subsonic filter to cut out signals below 15Hz.

Power Amplifier

With a current-mirror load differential amplifier in the first stage and a constant current circuit inserted in the load of the driver stage, high gain can be obtained under stable operating conditions. A 2-stage Darlington complementary connection is used in the power amplifier stage for an effective output power of 70W +70W (8Ω, 20Hz ~ 20kHz) with less than 0.04% harmonic distortion (20Hz ~ 20 kHz at rated output power).

Protection Circuit

The SA-930 features the standard Pioneer protection circuit which is activated when a DC voltage appears at the power amplifier output (speaker protection) and when the power is switched on and off (muting action).

Function Switches

Function switching in the SA-930 is performed by the combined operation of monolithic IC PD 3001 (microcomputer) and PA4008 (electronic switch). When the Pioneer one-touch auto play system (PL-930, TX-930, CT-930) is connected to the automatic switching terminals on the rear panel of the SA-930, the program source is automatically switched to the component that is being used.

Level Indicator

The SA-930 uses an LED level meter module that displays levels with a 12-bit display.

7.2 OPERATION OF CONTROL SECTION CIRCUIT

7.1.1 Function Switching

When the power switch is turned on, the program in the microcomputer (Q301) automatically sets the function to the TUNER setting.

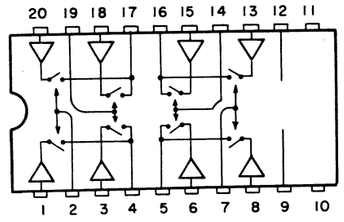


Fig. 7-1 PA4008 Block diagram

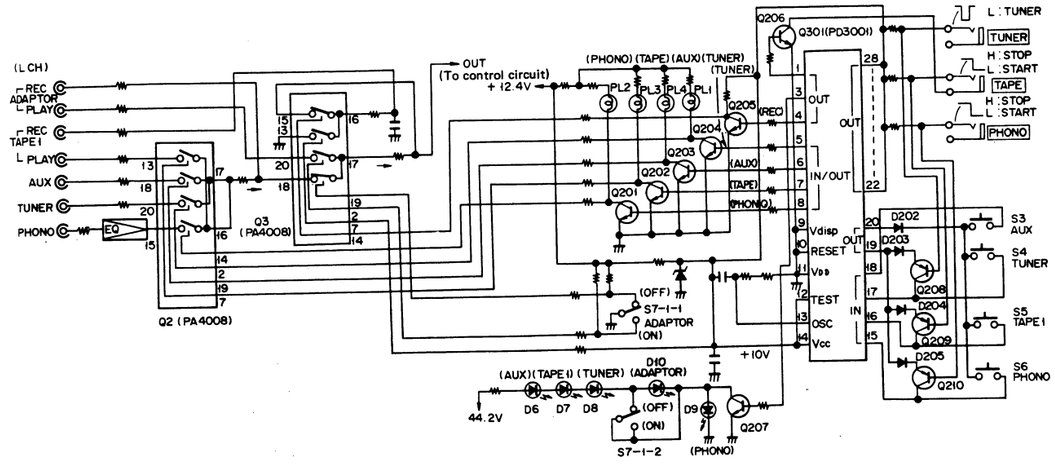


Fig. 7-2 Function switch control section

■ **PHONO Switch ON (Fig. 7-2)**

1. Pins 20 and 19 of Q301 (PD3001) are high level output terminals. When function switch S6 (PHONO) is pressed, the high level signal output from pin 20 of Q301 passes through D202 and S6 and goes to pin 15 of Q301.
2. A high level signal is output from pin 8 of Q301 to turn on Q201. Simultaneously, lamp PL2 lights up.
3. When Q201 turns on, the potential on the collector side of Q201 drops, pin 14 of Q2 goes to the low level causing the switches of pin 15 and 16 of Q2 to turn on. (electronic switches)
4. If adaptor switch S7 is off, the contact point on the off side is grounded. This makes pin 19 of Q3 go to the low level and switches on the switches of pins 18 and 17 of Q3. This causes the signal received through the phono terminals to pass through the switches of Q2 and Q3 and go to the control circuit.
5. If the adaptor switch is on, the contact point on the on side is grounded. This makes pin 19 of Q3 go to the high level and switches off the switches of pins 18 and 17. At the same time, pin 2 of Q3 goes to the low level to switch on the switches of pins 20 and 17 of Q3 and send the signal received through the adaptor's play terminals to the control circuit. The path of these signals is shown in figure 7-3.

■ **TAPE 1 Switch ON (Fig. 7-2)**

1. In the same manner as when the phono switch is pressed, pin 7 of Q301 goes to the high level when the tape 1 switch S5 is pressed. This turns on Q202 to light up PL3. Pin 7 of Q2 goes to the low level and the switches of pins 13 and 16 of Q2 turned on.
2. Simultaneously, pin 4 of Q301 goes to the low level and Q205 turns off. When Q205 turns off, pin 14 of Q3 switches to the high level and the switches off pins 15 and 16 of Q3. The reason for this is to prevent oscillations when tape 1 is used by forming a signal loop between the play and rec terminals (Q205 is on at all times except when tape 1 is used). The path of these signals is shown in figure 7-4.

■ **AUX Switch ON (Fig. 7-2)**

1. When the AUX switch S3 is pressed, pin 6 of Q301 goes to the high level and Q203 is turned on. At the same time, PL4 lights up.
2. Pin 19 of Q2 goes to the low level and the switches of pins 18 and 17 or Q2 switch on. When the adaptor switch is in the off position, the signal received through the aux terminals passes through pins 18 and 17 of Q2 and goes to the control circuit. The path of these signals is shown in figure 7-5.

■ **TUNER Switch On (Fig. 7-2)**

1. When the TUNER switch S4 is turned on, pin 5 of Q301 goes to the high level and Q204 is turned on. At the same time, PL4 lights up.
2. Pin 19 of Q2 goes to the low level and the switches of pins 18 and 17 of Q2 switch on. When the adaptor switch is in the off position, the signal received through the tuner terminals passes through pins 20 and 17 of Q2 and goes to the control circuit. The path of these signals is shown in figure 7-6.

7.1.2 Function Switching Using the Automatic Switching Terminals (see Fig. 7-2)

When components capable of one-touch automatic play are connected to the phono, tuner, and tape 1 terminals of the SA-930, the function is automatically switched to the component being used.

■ **PHONO Automatic Switching Terminal**

When the start switch of the tuntable (PL-730 or PL-930) connected to the phono automatic switching terminal is pressed, the low level signal generated by the turntable at that time turns on Q210. When Q210 is on, pin 8 of Q301 outputs a high level signal which turns on Q201. From this point on, operations are the same as in the phono switch on section.

■ **TUNER Automatic Switching Terminal**

When the FM or AM switch of the tuner (TX-930) connected to the tuner automatic switching terminal is pressed, the low level signal generated by the tuner at that time turns on Q208. When Q208 is on, pin 5 of Q301 outputs a high level signal which turns on Q204. From this point on, operations are the same as in the tuner switch on section.

■ **TAPE 1 Automatic Switching Terminal**

When the PLAY switch of the cassette tape deck (CT-930) connected to the tape 1 automatic switching terminal is pressed, the low level signal generated by the deck at that time turns on Q209. When Q209 is on, pin 7 of Q301 outputs a high level signal which turns on Q202. From this point on, operations are the same as in the tape 1 switch on section.

■ **PHONO Switch ON (Fig. 7-2)**

1. Pins 20 and 19 of Q301 (PD3001) are high level output terminals. When function switch S6 (PHONO) is pressed, the high level signal output from pin 20 of Q301 passes through D202 and S6 and goes to pin 15 of Q301.
2. A high level signal is output from pin 8 of Q301 to turn on Q201. Simultaneously, lamp PL2 lights up.
3. When Q201 turns on, the potential on the collector side of Q201 drops, pin 14 of Q2 goes to the low level causing the switches of pin 15 and 16 of Q2 to turn on. (electronic switches)
4. If adaptor switch S7 is off, the contact point on the off side is grounded. This makes pin 19 of Q3 go to the low level and switches on the switches of pins 18 and 17 of Q3. This causes the signal received through the phono terminals to pass through the switches of Q2 and Q3 and go to the control circuit.
5. If the adaptor switch is on, the contact point on the on side is grounded. This makes pin 19 of Q3 go to the high level and switches off the switches of pins 18 and 17. At the same time, pin 2 of Q3 goes to the low level to switch on the switches of pins 20 and 17 of Q3 and send the signal received through the adaptor's play terminals to the control circuit. The path of these signals is shown in figure 7-3.

■ **TAPE 1 Switch ON (Fig. 7-2)**

1. In the same manner as when the phono switch is pressed, pin 7 of Q301 goes to the high level when the tape 1 switch S5 is pressed. This turns on Q202 to light up PL3. Pin 7 of Q2 goes to the low level and the switches of pins 13 and 16 of Q2 turned on.
2. Simultaneously, pin 4 of Q301 goes to the low level and Q205 turns off. When Q205 turns off, pin 14 of Q3 switches to the high level and the switches off pins 15 and 16 of Q3. The reason for this is to prevent oscillations when tape 1 is used by forming a signal loop between the play and rec terminals (Q205 is on at all times except when tape 1 is used). The path of these signals is shown in figure 7-4.

■ **AUX Switch ON (Fig. 7-2)**

1. When the AUX switch S3 is pressed, pin 6 of Q301 goes to the high level and Q203 is turned on. At the same time, PL4 lights up.
2. Pin 19 of Q2 goes to the low level and the switches of pins 18 and 17 or Q2 switch on. When the adaptor switch is in the off position, the signal received through the aux terminals passes through pins 18 and 17 of Q2 and goes to the control circuit. The path of these signals is shown in figure 7-5.

■ **TUNER Switch On (Fig. 7-2)**

1. When the TUNER switch S4 is turned on, pin 5 of Q301 goes to the high level and Q204 is turned on. At the same time, PL4 lights up.
2. Pin 19 of Q2 goes to the low level and the switches of pins 18 and 17 of Q2 switch on. When the adaptor switch is in the off position, the signal received through the tuner terminals passes through pins 20 and 17 of Q2 and goes to the control circuit. The path of these signals is shown in figure 7-6.

7.1.2 Function Switching Using the Automatic Switching Terminals (see Fig. 7-2)

When components capable of one-touch automatic play are connected to the phono, tuner, and tape 1 terminals of the SA-930, the function is automatically switched to the component being used.

■ **PHONO Automatic Switching Terminal**

When the start switch of the tuntable (PL-730 or PL-930) connected to the phono automatic switching terminal is pressed, the low level signal generated by the turntable at that time turns on Q210. When Q210 is on, pin 8 of Q301 outputs a high level signal which turns on Q201. From this point on, operations are the same as in the phono switch on section.

■ **TUNER Automatic Switching Terminal**

When the FM or AM switch of the tuner (TX-930) connected to the tuner automatic switching terminal is pressed, the low level signal generated by the tuner at that time turns on Q208. When Q208 is on, pin 5 of Q301 outputs a high level signal which turns on Q204. From this point on, operations are the same as in the tuner switch on section.

■ **TAPE 1 Automatic Switching Terminal**

When the PLAY switch of the cassette tape deck (CT-930) connected to the tape 1 automatic switching terminal is pressed, the low level signal generated by the deck at that time turns on Q209. When Q209 is on, pin 7 of Q301 outputs a high level signal which turns on Q202. From this point on, operations are the same as in the tape 1 switch on section.

7.1.3 Other Functions

■ **Cassette Deck Auto-Stop**

The SA-930 automatically stops the cassette tape deck when a different program source (turntable, tuner or aux) is selected. This is performed by a program in the microcomputer (Q301) that is activated when the function is switched to a program source from the tape 1 setting. The program turns off Q206 to automatically stop the the cassette deck.

■ **Turntable Off Function**

When the function is switched from phono to another program source, the microcomputer (Q301) sends out an order for Q207 to repeat its on/off operation if the turntable has not been turned off. When the on/off operation of Q207 is repeated, D9 flashes on and off to show that the turntable has been left on. Once the turntable has been stopped, the microcomputer detects a signal from the phono automatic switching terminal and turns off Q207. This causes D9 to stop flashing on and off and remain lit.

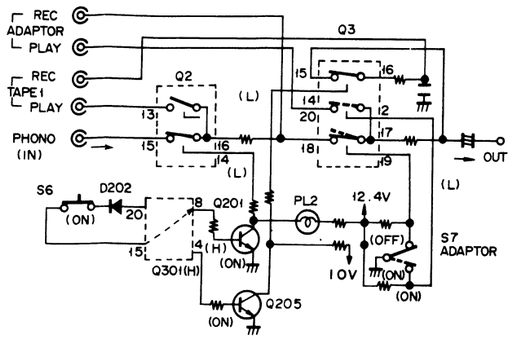


Fig. 7-3 Signal path with phono on, adaptor off

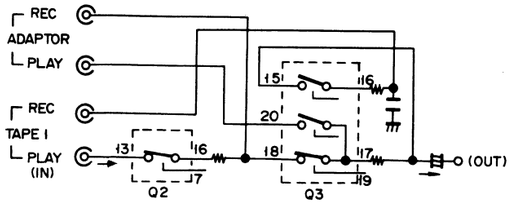


Fig. 7-4 Signal path for tape 1 on, adaptor off

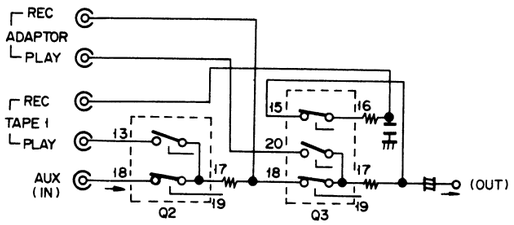


Fig. 7-5 Signal path for aux on, adaptor off

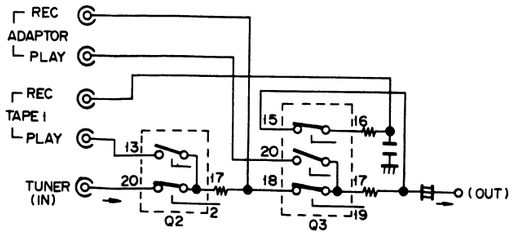
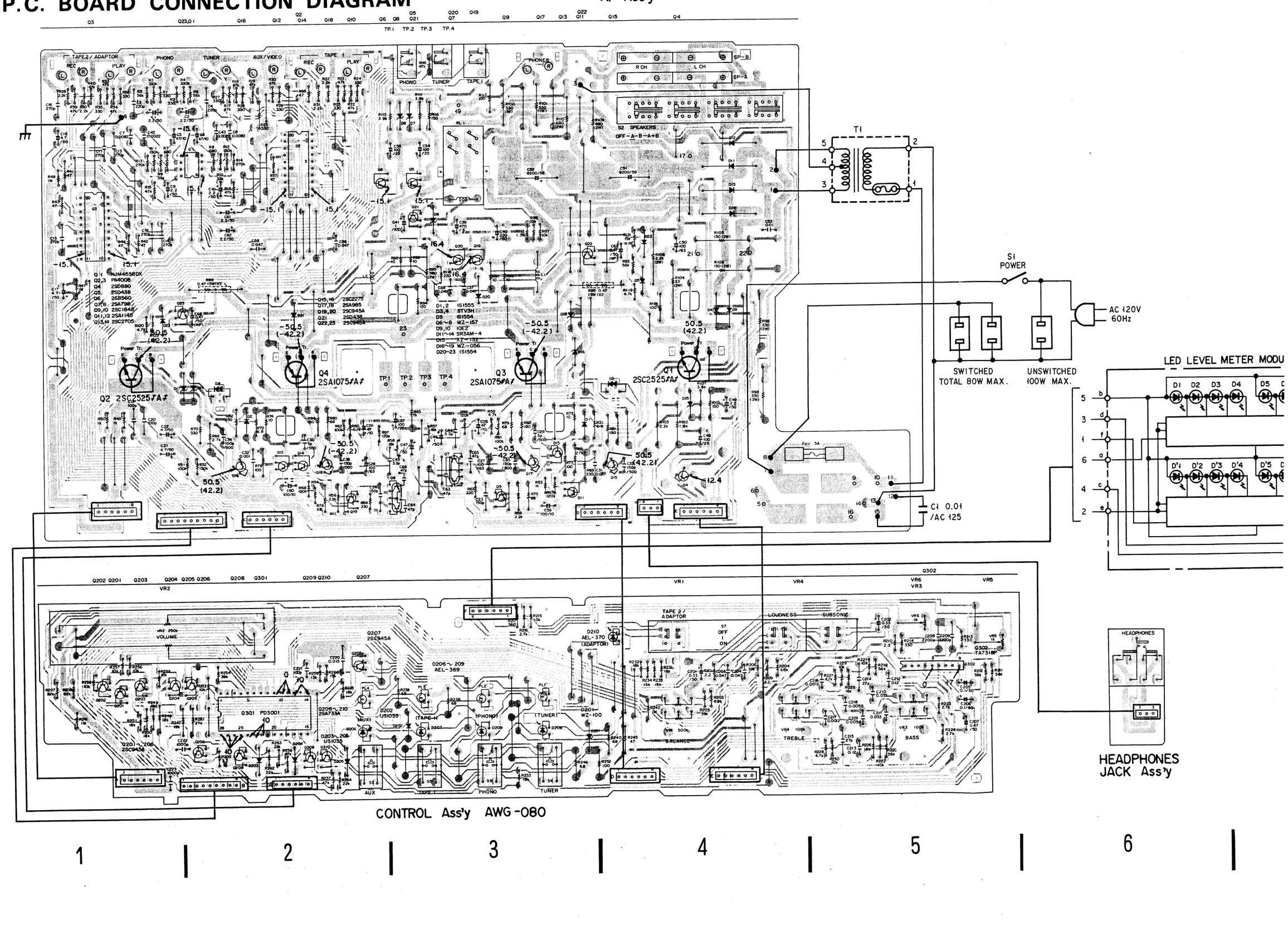


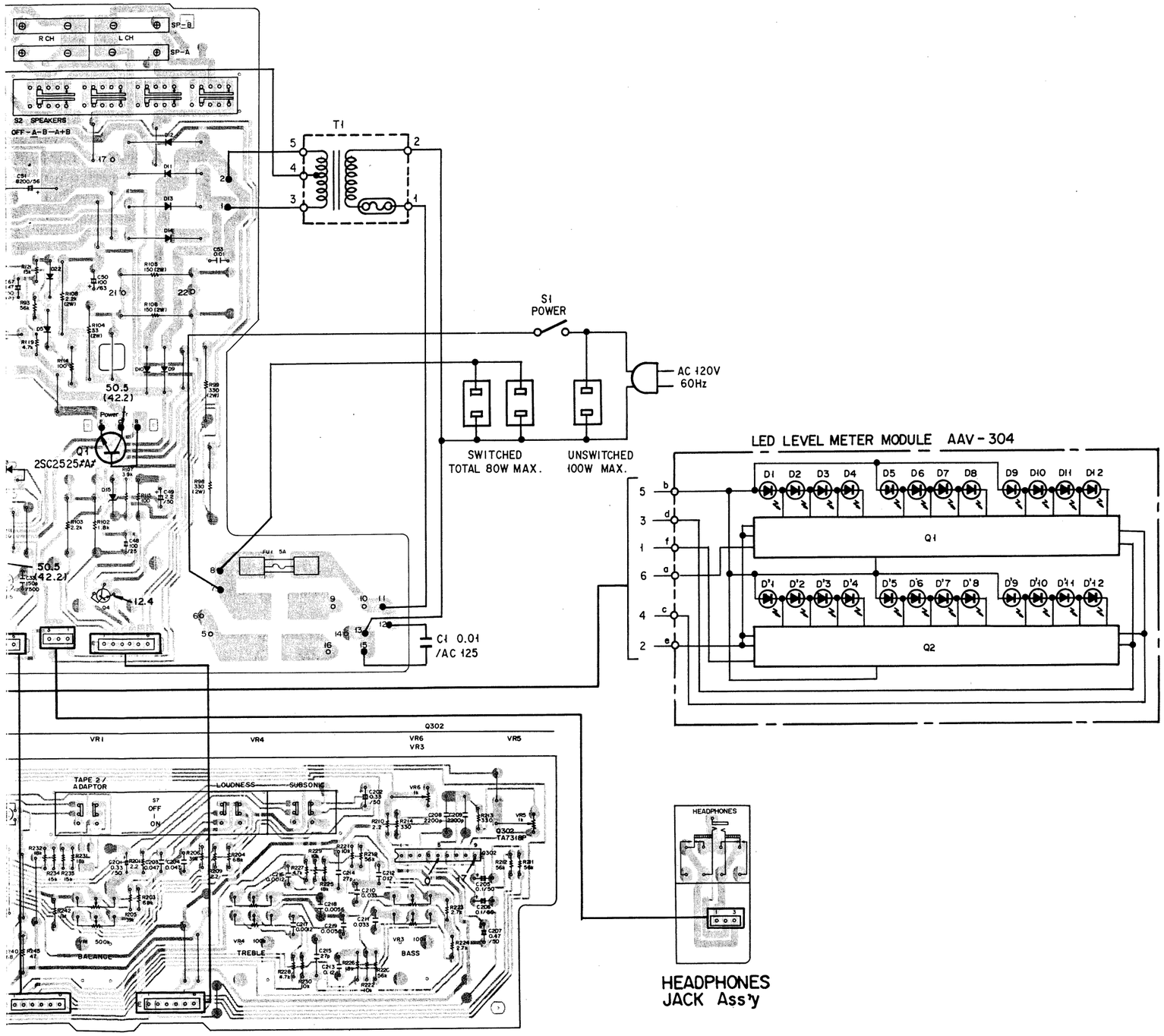
Fig. 7-6 Signal path for tuner on, adaptor off

8. P.C. BOARD CONNECTION DIAGRAM

AF Ass'y

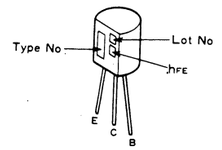


F Ass'y

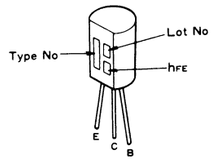


External Apperance of Transistors and ICs

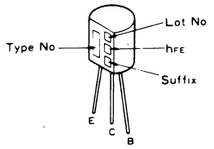
2SA1145
2SC2705



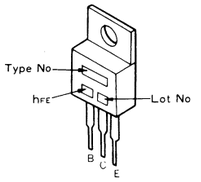
2SB560
2SC1845



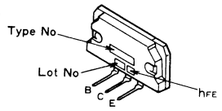
2SA733A
2SC945A



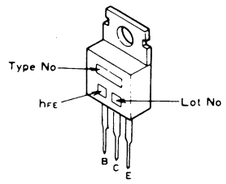
2SC2275
2SA985



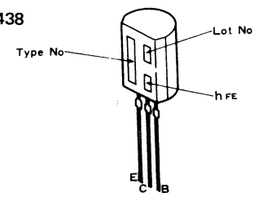
2SC2525/A/
2SA1075/A/



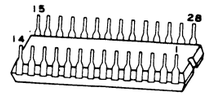
2SD313
2SD880



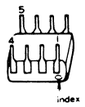
2SD438



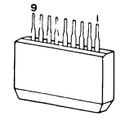
PD3001



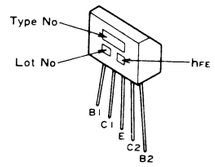
NJM4558DX
μPC4558CP



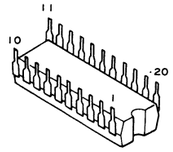
TA7318P-1



2SA798

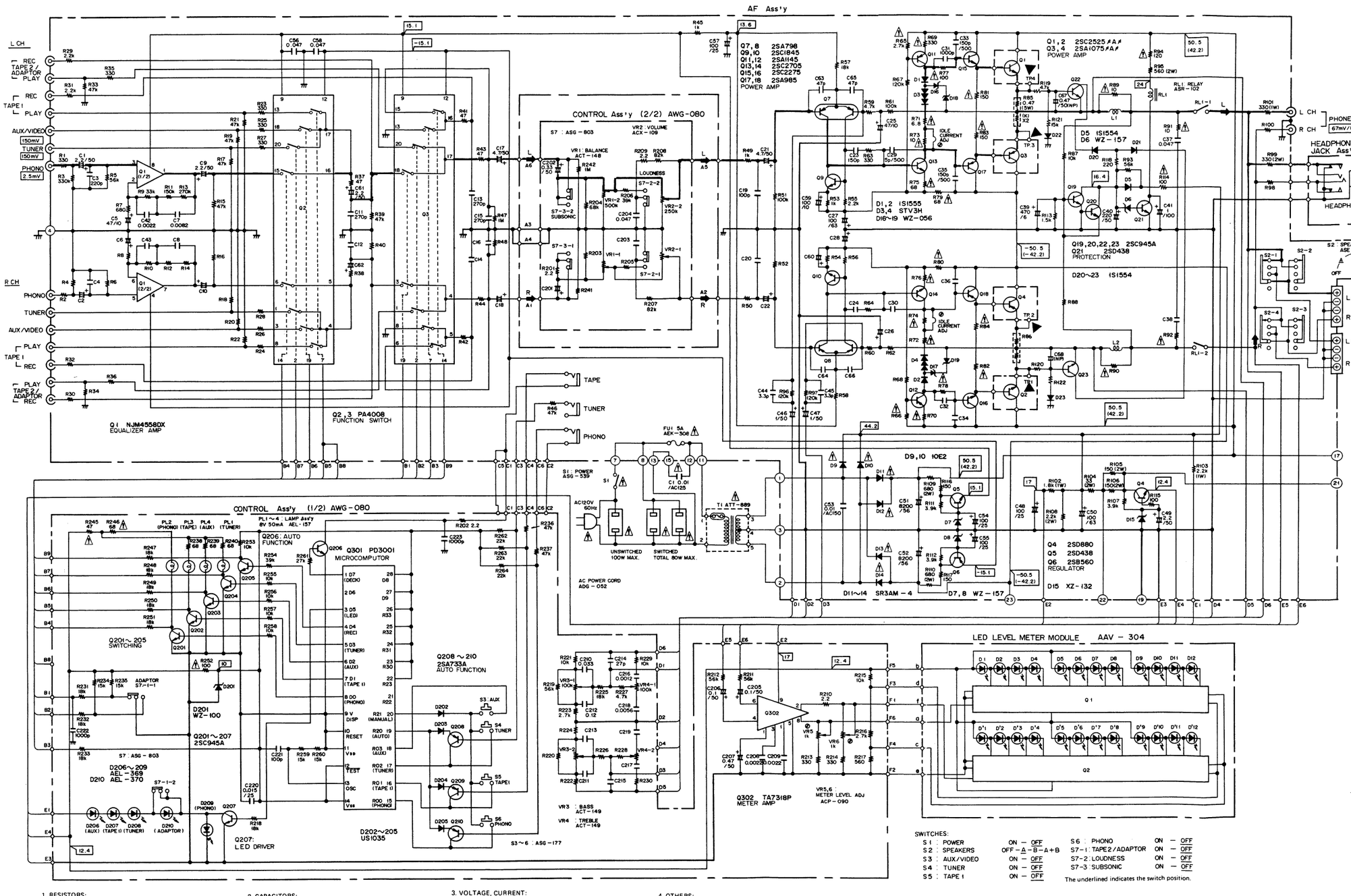


PA4008



9. SCHEMATIC DIAGRAM

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



1. RESISTORS:
Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
: Signal voltage at 70 W + 70 W 8Ω output (1kHz)
: DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power.
mA : DC current at no input signal
mV : Signal voltage at FM 400Hz 75kHz DEV.

4. OTHERS:
: Signal route.
: Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

SWITCHES:

S1 : POWER	ON — OFF		S6 : PHONO	ON — OFF	
S2 : SPEAKERS	OFF — A — B — A+B		S7-1 : TAPE2/ADAPTOR	ON — OFF	
S3 : AUX/VIDEO	ON — OFF		S7-2 : LOUDNESS	ON — OFF	
S4 : TUNER	ON — OFF		S7-3 : SUBSONIC	ON — OFF	
S5 : TAPE 1	ON — OFF				

The underlined indicates the switch position.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

10. PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56 x 10¹*	*561*	*RD¼PS 5 6 1 J*
47kΩ	*47 x 10³*	*473*	*RD¼PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 x 100*	*5621*	*RN¼SR 5 6 2 1 F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number , temperature, humidity, etc.

MISCELLANEOUS PARTS

P.C. BOARD ASSEMBLIES

Mark	Part No.	Symbol & Description
	AWK-201	AF assembly
	AWG-080	Control assembly

OTHERS

Mark	Part No.	Symbol & Description
⚠ ★	ATT-889	T1 Power transformer (120V)
⚠ ★★	AEK-308	FU1 Fuse (5A)
⚠ ★★	ASG-539	S1 Push switch (POWER)
★★	ASX-189	Rorary switch (SPEAKERS)
⚠	ACG-017	C1 Ceramic capacitor (0.01/ AC125V)
⚠	AKP-501	AC socket (AC OUTLETS)
⚠	ADG-052	AC power cord
★★	2SC2525/A/-B* (2SC2525/A/-G)*	Q1, Q2 Transistor
★★	2SA1075/A/-B* (2SA1075/A/-G)*	Q3, Q4 Transistor
	*hfe of Q1—Q4 should have the same value.	
	AEC-756	Mica wafer

CONTROL ASSEMBLY (AWG-080)

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA R33M 50L	C201, C202
	CEA 0R1M 50L	C205, C206
	CEA R47M 50L	C207
	CQMA 122J 50	C216, C217
	CQMA 562J 50	C218, C219
	CQMA 333J 50	C210, C211
	CQMA 473J 50	C203, C204
	CQMLA 124K 50	C212, C213
	CKDYB 102K 50	C222, C223
	CCDCH 101J 50	C221
	CKPYX 153N 25	C220
	CKPYX 222N 50	C208, C209
	CCPSL 270J 50	C214, C215

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	ACT-148	VR1 Variable (BALANCE)
★	ACX-109	VR2 Variable (VOLUME)
★	ACT-149	VR3, VR4 Variable (BASS, TREBLE)
★	ACP-090	VR5, V6 Semi-fixed
	RD¼PMFL101J	R252
	RD¼PM □□□J	R238—R240, R245, R246
	RD 1/8 PM □□□J	R201—R237, R241, R242, R247—R251, R253—R264

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SC945A	Q201—Q207
★★	2SA733A	Q208—Q210
★★	PD3001	Q301
★★	TA7318P-1	Q302
★	WZ-100 (MZ-100)	D201
★	US1035 (1S1555) (1S2473) (1S2076)	D202—D205
★	AEL-369	D206—D209 LED
★	AEL-370	D210 LED

OTHERS

Mark	Part No.	Symbol & Description
★★	AEL-157	PL1-PL4 Lamp assembly
★	AAV-304	LED level meter module
★★	ASG-177	S3-S6 Tact switch (AUX, TUNER, TAPE1, PHONO)
★★	ASG-803	S7 Push switch (ADAPTOR/ LOUDNESS/SUBSONIC)

AF ASSEMBLY (AWK-201)

AF assembly

CAPACITORS

Mark	Part No.	Symbol & Description
	ACH-238	C51, C52 Electric capacitor (8200/56V)
	ACG-019	C53 Ceramic capacitor (0.01/ AC150V)
	CEANL 2R2M 50	C1, C2
	CEA 101M 63L	C27, C28, C50
	CEA 221M 50L	C40
	CEA 010M 100L	C41
	CEA 2R2M 50L	C9, C10, C49, C61, C62
	CEA 4R7M 50L	C17, C18, C21, C22
	. . . . .	
	CEA 470M 10L	C5, C6, C25, C26
	CEA 101M 10L	C59, C60
	CEA 101M 25L	C48, C54, C55, C57
	CEA 471M 6L	C39
	CEANL 010M 50	C46, C47
	CQMA 222J 50	C42, C43
	CQMA 822J 50	C7, C8
	CQMA 473J 50	C37, C38
	CCDSL 050C 500	C29, C30
	CCDSL 151K 500	C33—C36
	CKDYF 473Z 50	C56, C58
	CCPSL 3R3K 50	C44, C45
	CCPSL 101J 50	C19, C20
	CKPYB 151K 50	C23, C24
	CKPYB 221K 50	C3, C4
	CKPYB 271K 50	C11—C16
	CKPYB 102K 50	C31, C32
	CCPSL 470J 50	C63, C65
	CCDSL 470J 50	C64, C66
	CEANP R47M 50	C67, C68

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	ACN-130	R85, R86 Wire wound
	RS1L □□□J	R100—R103
	RS2L □□□J	R95, R104—R106, R108—R110
	RS2LF331J	R98, R99
⚠	RD¼PMFL □□□J	R65, R66, R75—R84, R89—R92, R114
	RFA¼PL 331J	R69, R70
⚠	RD¼PMF □□□J	R71—R74, R94
	RD¼PM □□□J	R45, R55, R56, R107, R111, R112, R115—R118
	RD1/8 PM □□□J	R1—R44, R46—R54, R57—R64, R67, R68, R87, R88, R93, R96, R97, R113, R119—R122

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	NJM4558DX (μPC4558CP)	Q1
★★	PA4008	Q2, Q3
★★	2SD880 (2SD313)	Q4
★★	2SD438	Q5, Q21
★★	2SB560	Q6
★★	2SA798	Q7, Q8
★★	2SC1845	Q9, Q10
★★	2SA1145	Q11, Q12
★★	2SC2705	Q13, Q14
★★	2SC2275-P* (2SC2275-Q)*	Q15, Q16
★★	2SA985-P* (2SA985-Q)*	Q17, Q18
★★	2SC945A	Q19, Q20, Q22, Q23
	*hfe of Q15—Q18 should have the same value.	
★	1S1555 (1S2473) (1S2076)	D1, D2
★	STV3H-0	D3, D4
★	1S1554	D5, D20—D23
★	WZ-157 (MZ-157)	D6—D8
⚠ ★	10E2FD	D9, D10
⚠ ★	SR3AM-4/H/	D11—D14
★	XZ-132	D15
★	WZ-056	D16—D19

OTHERS

Mark	Part No.	Symbol & Description
	AKB-077	Terminal (PHONES)
	AKB-078	Terminal (TAPE1, TAPE2/ADAPTOR)
	AKB-079	Terminal (PHONO/TUNER/AUX)
	AKN-034	Terminal (PHONO, TUNER, TAPE1)
	AKE-102	Terminal (SPEAKERS)
	AKH-016	Transistor socket
★★	ASR-102	RL1 Relay
★★	ASX-118	S2 Slide switch
	AEC-852	Varistor diode cover
	PBZ030P060FMC	Screw

Headphone assembly

Mark	Part No.	Symbol & Description
	AKN-041	Headphone jack

11. ADJUSTMENTS

Idle Current

1. Set the SPEAKERS switch to the OFF position, turn the VOLUME all the way down and then turn power on for about 10 minutes.
2. After the power has been left on for about 10 minutes, confirm that the voltages between TP4 ⊕ and TP3 ⊖ (the left channel) and between TP1 ⊕ and TP2 ⊖ are each between 4.5mV and 100mV. If a voltage is below 4.5mV, cut the jumper wire of the channel where the problem exists (jumper wire A for the left, jumper wire B for the right).

NOTE:
If a voltage is above 100mV, check the circuits to see if there is a malfunction.

Output Indicators (Level Meter)

1. Remove the front panel assembly following the directions in the disassembly section.
2. Set the SPEAKERS switch to the A position, the FUNCTION switch to the AUX setting and turn all other switches OFF.
   And connect an 8Ω resistor and AC voltmeter to the speaker output terminal.
3. Apply a 1kHz sine wave, 150mV signal to the AUX terminals and adjust the VOLUME (VR2) so that the voltage at speaker terminal A is AC8.95V.
4. Adjust VR 5 (left) and VR 6 (right), the semi-fixed resistance of the control assembly so that the output indicator reading is 10 watts.

Replacing the AF Assembly (AWK-201) P.C. Board

The AF assembly (AWK-201) used in the SA-930 can also be used in the SA-730. When replacing the AF assembly (AWK-201) of SA-930, cut jumper wire C (connected in parallel with R94, 120 ohms) and jumper wire D (connected in parallel with R104, 33 ohms).
At the same time, replace the fuse specification card and the 5A fuse.

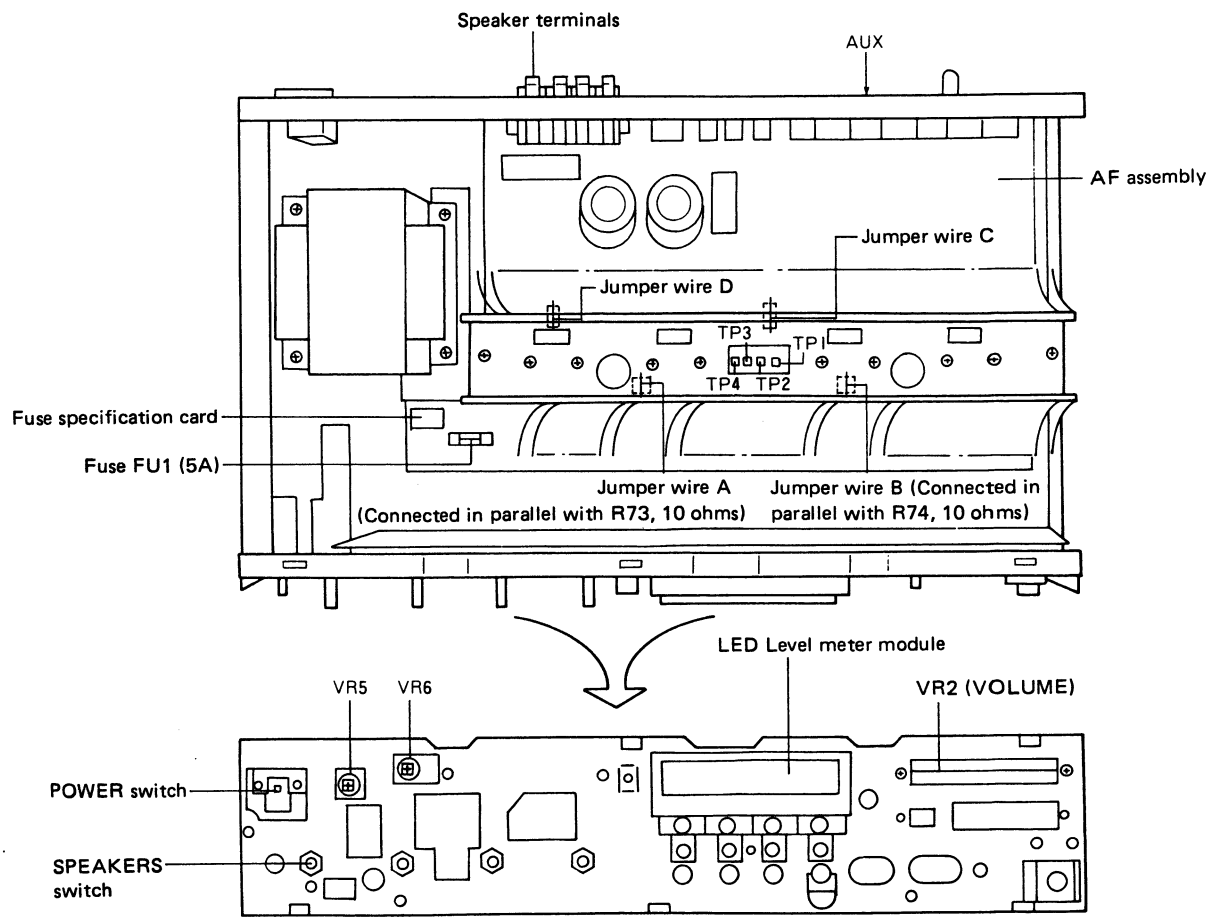


Fig. 11-1 Adjustment of idle current and output indicator

11. RÉGLAGE

Courant déwatté

1. Régler sur OFF le sélecteur d'enceintes (SPEAKERS), réduire au maximum la commande de VOLUME et placer sous tension pendant 10 minutes environ.
2. Après ces quelque 10 minutes, vérifier si les tensions entre TP4 (+) et TP3 (-) (le canal gauche) et entre TP1 (+) et TP2 (-) se trouvent respectivement entre 4,5mV et 100mV. Si la tension est inférieure à 4,5mV, couper la liaison du canal où le problème se manifeste (liaision A pour le gauche ou liaison B pour le droit).

Remarque:
Si une tension est supérieure à 100mV, férifier la présence éventuelle d'une défaillance dans les circuits.

Indicateurs de sortie (Niveau)

1. Déposer l'ensemble du panneau avant en suivant les explications de la section de démontage.
2. Placer le sélecteur d'enceintes (SPEAKERS) à la position A, le sélecteur de fonction (FUNCTION) à la position AUX et toutes les autres commandes sur OFF.
   Et brancher une résistance de 8Ω et un voit métre en CA aux bornes de sorties des enceintes.
3. Appliquer une onde sinusoïdale de 1kHz, un signal de 150mV aux bornes AUX et régler la commande de VOLUME (VR2) de sorte que la tension à la borne d'enceinte A soir 8,95V en courant alternatif.
4. Ajustar VT5 (gauche) et VR6 (droit), la résistance semi-fixe de l'ensemble de contrôle de sorte que la lecture de l'indicateur de sortie soit de 10 watts.

Remplacement de la plaquette de circuit imprimé Ensemble AF (AWK-201)

L'ensemble AF (AWF-201) utilisé dans le SA-930, peut également servir dans le SA-730. Lors du remplacement de l'ensemble AF (AWK-201) du SA-930, couper la liaison C (raccordée en parallèle avec le R94, 120 ohms) et la liaison D (raccordée en parallèle avec R104, 33 ohms).
En même temps, remplacer la carte des spécifications de fusible et le fusible 5A.

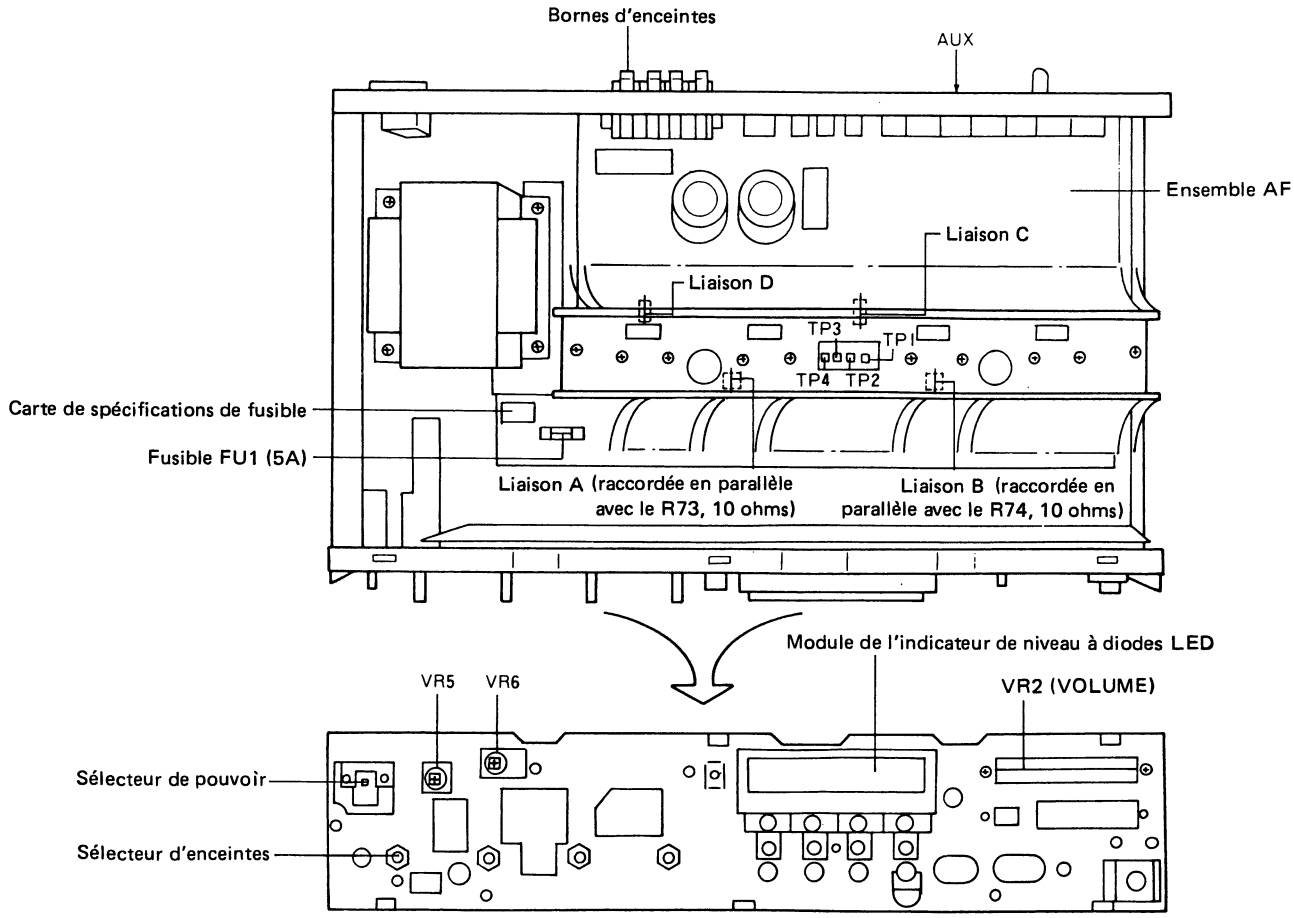


Fig. 11-1 Réglage du courant déwatté et de l'indicateur de sortie

11. ADJUSTE

Corriente reactiva

1. Poner el selector de altavoces (SPEAKERS) en la posición OFF, reducir completamente el VOLUMEN y conectar la alimentación durante unos 10 minutos.
2. Después de haber dejado conectada la alimentación durante unos 10 minutos, confirmar que las tensiones entre TP4 (+) y TP3 (-) (canal izquierdo) y entre TP1 (+) y TP2 (-) están entre 4,5mV y 100mV. Si la tensión está por debajo de 4,5mV, cortar el cable de conexión provisional del canal donde exista el problema (cable de conexión provisional A para el izquierdo, y cable B para el derech).

NOTA:
Si la tensión está por encima de los 100mV, comprobar los circuitos para ver si existe algún malfuncionamiento.

Indicadores de salida (Medidor de nivel)

1. Extraer el conjunto de panel frontal seiguiendo las instrucciones de la sección de desmontaje.
2. Poner el selector SPEAKERS en la posición A, el selector de función (FUNCTION) en la posición AUX, y poner todos los demas interruptores en las posiciones OFF.
   Entonces, conectar un presistor de 8ohmios y el voltimetro de CA al terminal de salida de altavoz.
3. Aplicar unda onda sinusoidal de 1kHz, y una señal de 150mV a los terminales AUX y ajustar el VOLUMEN (VR2) de modo que la tensión en el terminal A de altavoz sea de 8,95V CA.
4. Ajustar VR5 (izquierdo) y VR6 (derecho), en la resistencia semifija del conjunto de control de modo que el indicador de salida indique 10 vatios.

Reemplazo del tablero PC del conjunto AF (AWK-201)

El conjunto AF (AWK-201) utilizado en el SA-930 también puede utilizarse en el SA-730. Cuando se reemplace el conjunto AF (AWK-201) del SA-930, cortar el cable de conexión provisional C (conectado en paralelo con la R94, 120 ohmios) y el cable de conexión provisional D (conectado el paralelo con la R104, 33 ohmios).
Al mismo tiempo, reemplazar la tarjeta de especificaciones de fusibles y el fusible de 5A.

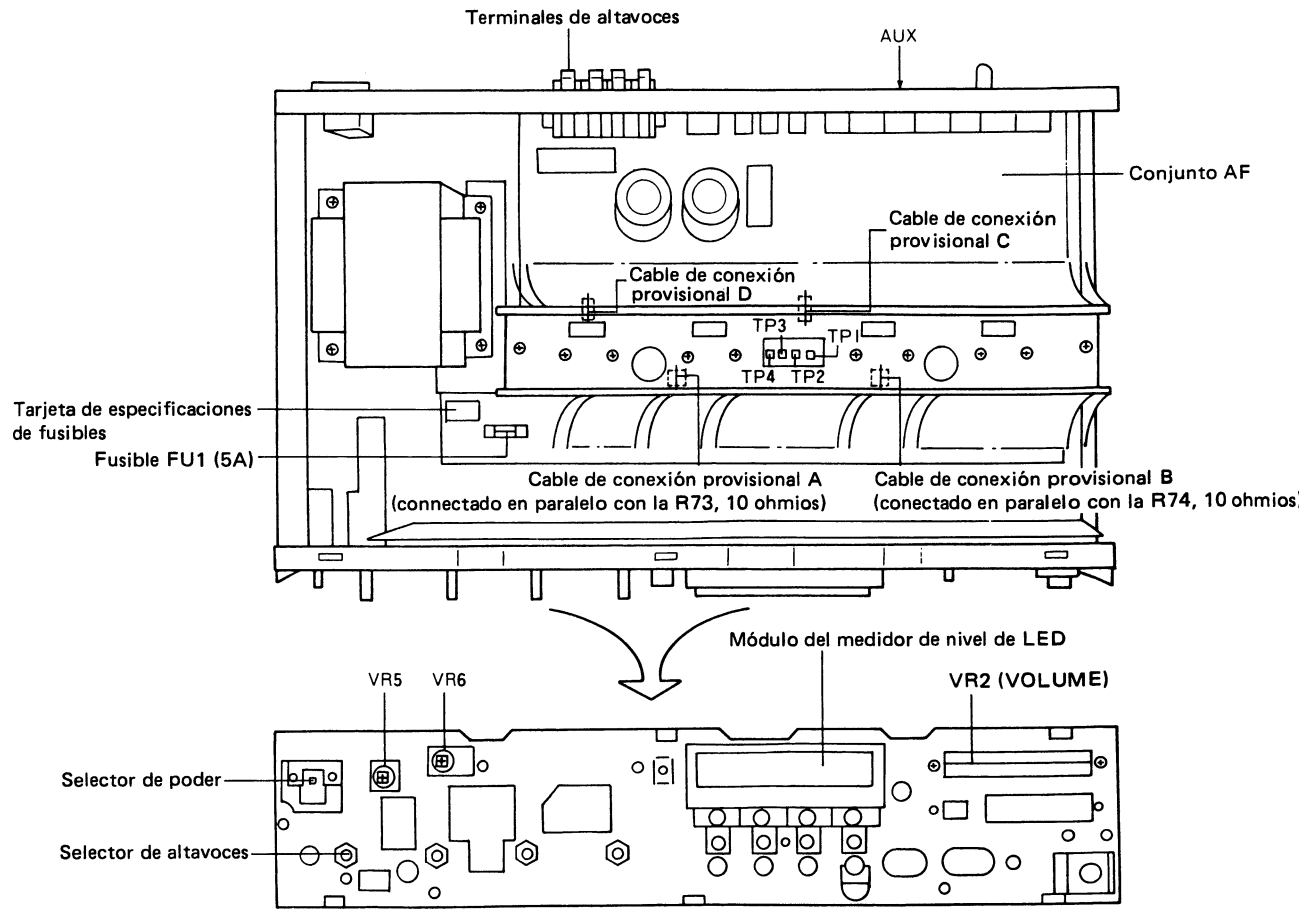
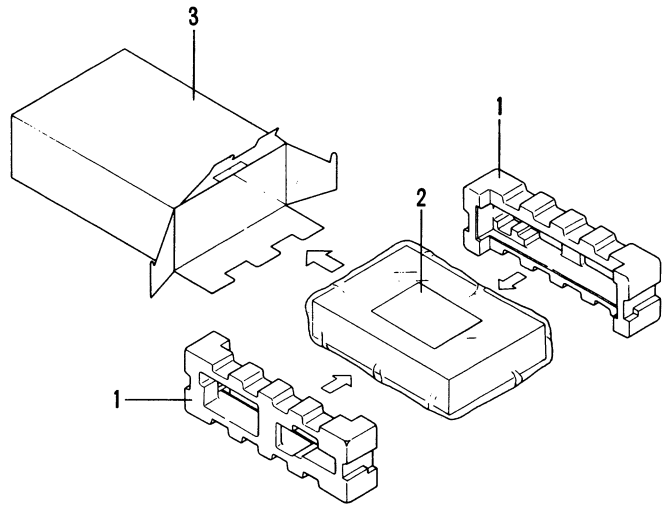


Fig. 11-1 Ajuste de la corriente reactiva y del indicador de salida

12. PACKING

Parts List

Mark	No.	Part No.	Description
	1.	AHA-298	Front rear pad
	2.	ARB-474	Operating instructions (English)
	3.	AHE-024	Packing case



13. FOR S, S/G, YP, HE, HB AND HEZ TYPES

13.1 SPECIFICATIONS

The specifications for the SA-930/S, S/G, HE, HEZ, HB and YP types are the same as the SA-930/KU type except for following sections.

Amplifier Section ..... HE, HB, HEZ, YP, S, and S/G types

Continuous Power Output
20 to 20,000Hz . . 70W + 70W (T.H.D. 0.04%, 8 ohms)
1kHz (DIN) ..... 84W + 84W (T.H.D. 1%, 8 ohms)
Total Harmonic Distortion (20Hz to 20kHz, 8 ohms, from AUX/VIDEO)
Continuous rated power output . . No more than 0.04%
Hum and Noise (DIN, continuous power/50mW)
PHONO 71dB/62dB
TUNER, AUX/VIDEO, TAPE PLAY 1,2/ADAPTOR 88dB/62dB

NOTE:
The damping factor of the KU type is not applied to HEZ type.
Frequency Response (HEZ type only).
AUX/VIDEO ..... 10Hz to 80,000Hz±3dB

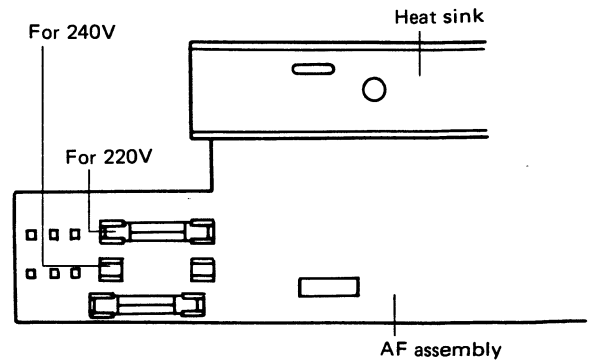
Miscellaneous

Power Requirements
S, S/G types ..... AC110V, 120V, 220V and 240V 50/60Hz
HB, YP types ..... AC240V only, 50/60Hz
HE, HEZ types ..... AC220V only 50/60Hz
Power Consumptions
S, S/G types 140W
YP, HE, HB, HEZ types 370W

LINE VOLTAGE SELECTION (FOR HE, HB, HEZ TYPES)

Line voltage can be changed as follows:
1. Disconnect the AC power cord.
2. Remove the bonnet case.
3. Take out the fuse from the P.C. board.
4. Re-install the fuse in the correct voltage indication.
5. Stick the line voltage lable on the rear panel.

Description	Part No.
220V label	AAX-193
240V label	AAX-192



13.2 CONTRAST PARTS

SA-930/S, S/G, YP, HE, HB, AND HEZ types are same as the SA-930/KU type except for following sections.

MISCELLANEOUS PARTS

Mark	Symbol & Description		Part No.					
			KU type	S, S/G types	YP type	HE type	HB type	HEZ type
⚠ ★	T1	Power transformer (120V)	ATT-889	.....	.....	.....	.....	.....
⚠ ★	T1	Power transformer (110V, 120V, 220V and 240V)	.....	ATT-891	.....	.....	.....	.....
⚠ ★	T1	Power transformer (220V, 240V)	.....	.....	ATT-890	ATT-890	ATT-890	ATT-890
⚠ ★★	FU1	Fuse (5A)	AEK-308	.....	.....	.....	.....	.....
⚠ ★★	FU1, FU2	Fuse (2.5A)	.....	AEK-123	.....	.....	.....	.....
⚠ ★★	FU1	Fuse (T2A)	.....	.....	AEK-017	AEK-017	AEK-017	AEK-017
⚠ ★★	FU2	Fuse (T2.5A)	.....	.....	.....	AEK-403	.....	AEK-403
⚠ ★★	S8	Voltage selector switch	.....	AKX-063	.....	.....	.....	.....
⚠	C1	Ceramic capacitor (0.01/AC125V)	ACG-017	.....	.....	.....	.....	.....
⚠	C1	Ceramic capacitor (0.01/AC250V)	.....	ACG-001	ACG-001	ACG-001	ACG-001	ACG-001
	C2	Capacitor	.....	.....	.....	.....	.....	CQMA 223K 50
⚠ ★★	S1	Push switch (POWER)	ASG-539	ASG-539	ASG-522	ASG-522	ASG-522	ASG-522
⚠		AC power cord	ADG-052	ADG-060	ADG-067	ADG-065	ADG-063	ADG-065
		Strain relief	AEC-327	.....	.....	.....	.....	.....
⚠		AC socket (AC OUTLETS)	AKP-501	AKP-501	.....	AKP-502	AKP-503	AKP-502
		Tapping screw (for SPEAKERS terminal)	.....	.....	.....	.....	.....	ABA-115
		Operating instructions (English)	ARB-474	ARB-479	ARB-479	.....	ARB-479	.....
		Operating instructions (English/German/French/Italian)	.....	.....	.....	ARE-028	.....	.....
		Operating instructions (German)	.....	.....	.....	.....	.....	ARC-014
		Operating instructions (Spanish)	.....	ARC-021 (S type only)	.....	.....	.....	.....
		packing case	AHE-024	AHE-039	AHE-039	AHE-039	AHE-039	AHE-039

P.C. BOARD

Mark	Symbol & Description	Part No.					
		KU type	S, S/G types	YP type	HE type	HB type	HEZ type
	AF assembly	AWK-201					AWK-200

13.3 PARTS LIST (FOR HEZ TYPE)

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).
  560Ω 56 x 10¹ 561 ..... RD¼PS 5 6 1 J
  47kΩ 47 x 10³ 473 ..... RD¼PS 4 7 3 J
  0.5Ω 0R5 ..... RN2H 0 R 5 K
  1Ω 010 ..... RS1P 0 1 0 K
  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).
  5.62kΩ 562 x 100 5621..... RN¼SR 5 6 2 1 F
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★.
  This classification shall be adjusted by each distributor because it depends on model number , temperature, humidity, etc.

AF assembly (AWK-200)

CAPACITORS

Mark	Part No.	Symbol & Description
	ACH-238	C51, C52 Electric capacitor (8200/56V)
	ACG-019	C53 Ceramic capacitor (0.01/ AC150V)
	CEANL 2R2M 50	C1, C2
	CEA 101M 63L	C27, C28, C50
	CEA 221M 50L	C40
	CEA 010M 100L	C41
	CEA 2R2M 50L	C9, C10, C49, C61, C62
	CEA 4R7M 50L	C17, C18, C21, C22
	.....	
	CEA 470M 10L	C5, C6, C25, C26
	CEA 101M 10L	C59, C60
	CEA 101M 25L	C48, C54, C55, C57
	CEA 471M 6L	C39
	CEANL 010M 50	C46, C47
	COMA 222J 50	C42, C43
	CQMA 822J 50	C7, C8
	CQMA 473J 50	C37, C38
	CCDSL 050C 500	C29, C30
	CCDSL 151K 500	C33–C36
	CKDYF 473Z 50	C56, C58
	CCPSL 3R3K 50	C44, C45
	CCPSL 101J 50	C19, C20
	CKPYB 151K 50	C23, C24
	CKPYB 391K 50	C3, C4
	CKPYB 271K 50	C11–C16
	CKPYB 102K 50	C31, C32
	CKDYB 391K 50	C63–C72, C74, C75, C80
	CQMA 472K 50	C81, C82
	CKDYB 391K 50	C73, C76–C79
	CQMA 472K 50	C83, C84
	CCPSL 470J 50	C85–C87, C89
	CCDSL 470J 50	C88, C90

RESISTORS

Note: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	ACN-130	R85, R86 Wire wound
	RS1L □□□J	R100–R103
	RS2L □□□J	R95, R104–R106, R108–R110
	RS2LF331J	R98, R99
⚠	RD¼PMFL □□□J	R65, R66, R69, R70, R75–R84, R89–R92, R114
⚠	RD¼PMF □□□J	R71–R74, R94
	RD¼PM □□□J	R45, R55, R56, R107, R111, R112, R115–R117
	RD1/8 PM □□□J	R1–R44, R46–R54, R57–R64, R67, R68, R87, R88, R93, R96, R97, R113

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	NJM4558DX (μPC4558CP)	Q1
★★	PA4008	Q2, Q3
★★	2SD880 (2SD313)	Q4
★★	2SD438	Q5, Q21
★★	2SB560	Q6
★★	2SA798	Q7, Q8
★★	2SC1845	Q9, Q10
★★	2SA1145	Q11, Q12
★★	2SC2705	Q13, Q14
★★	2SC2275-P* (2SC2275-Q)*	Q15, Q16
★★	2SA985-P* (2SA985-Q)*	Q17, Q18
★★	2SC945A	Q19, Q20
	*hfe of Q15–Q18 should have the same value.	
★	1S1555 (1S2473) (1S2076)	D1, D2
★	STV3H-0	D3, D4
★	1S1554	D5
★	WZ-157 (MZ-157)	D6–D8
⚠ ★	10E2FD	D9, D10
⚠ ★	SR3AM-4/H/	D11–D14
★	XZ-132	D15
★	WZ-056	D16–D19

OTHERS

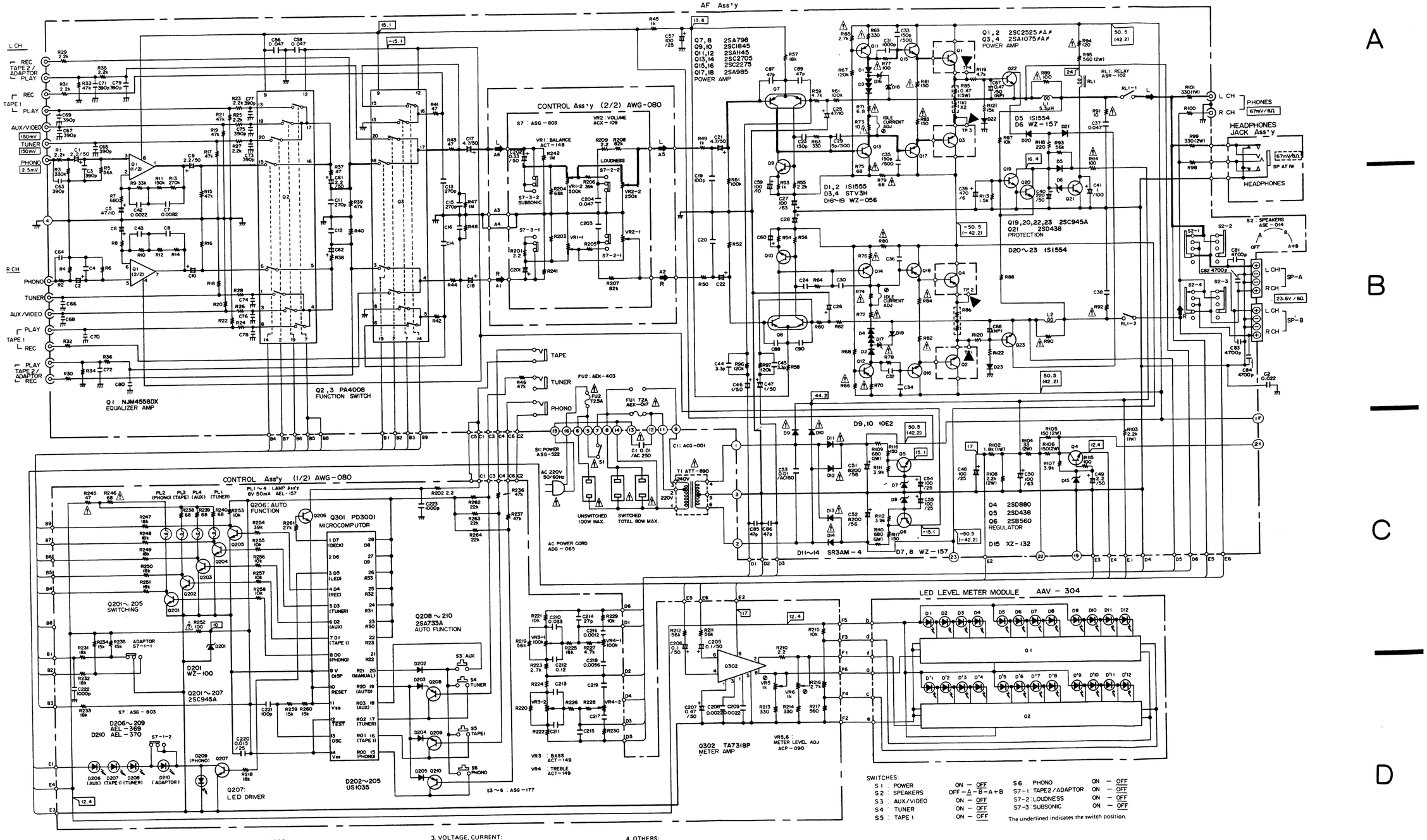
Mark	Part No.	Symbol & Description
	AKB-077	Terminal (PHONES)
	AKB-078	Terminal (TAPE1, TAPE2/ADAPTOR)
	AKB-079	Terminal (PHONO/TUNER/AUX)
	AKN-034	Terminal (PHONO, TUNER, TAPE1)
	AKE-102	Terminal (SPEAKERS)
	AKH-016	Transistor socket
★★	ASR-102	RL1 Relay
★★	ASX-118	S2 Slide switch
	AEC-852	Varistor diode cover
	PBZ030P060FMC	Screw

Headphone assembly

Mark	Part No.	Symbol & Description
	AKN-041	Headphone jack

13.4 SCHEMATIC DIAGRAM AND P.C. BOARD PATTERNS
For HEZ type

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



SWITCHES:

S1 : POWER	ON – OFF	S6 : PHONO	ON – OFF
S2 : SPEAKERS	OFF – A – B – A+B	S7-1 : TAPE2 / ADAPTOR	ON – OFF
S3 : AUX/VIDEO	ON – OFF	S7-2 : LOUDNESS	ON – OFF
S4 : TUNER	ON – OFF	S7-3 : SUBSONIC	ON – OFF
S5 : TAPE1	ON – OFF		

The underlined indicates the switch position.

1. RESISTORS:
Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% tolerance

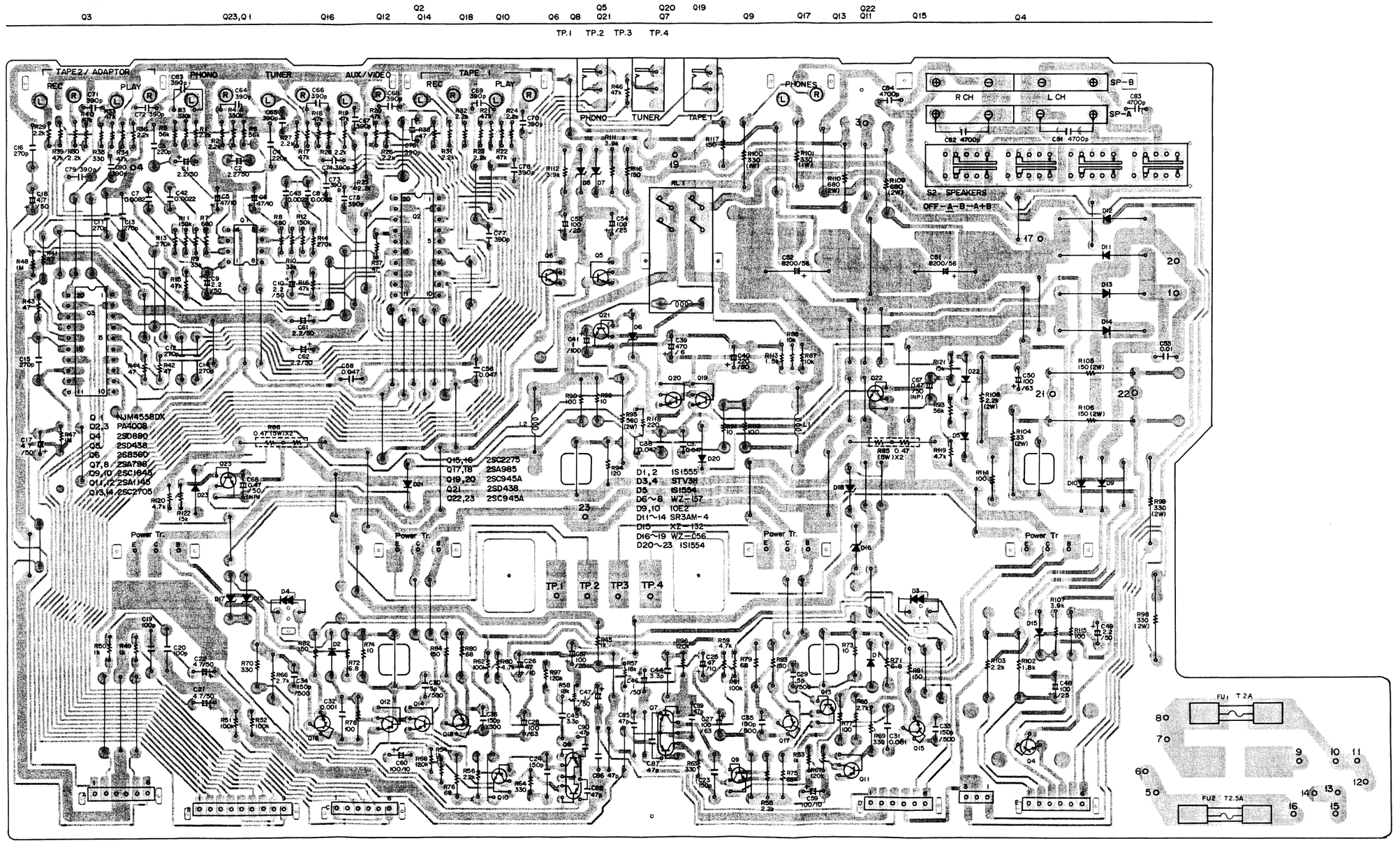
2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
: Signal voltage at 70 W + 70 W 8Ω output (1kHz)
: DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power.
mA : DC current at no input signal
mV : Signal voltage at FM 400Hz 75kHz DEV.

4. OTHERS:
: Signal route.
: Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

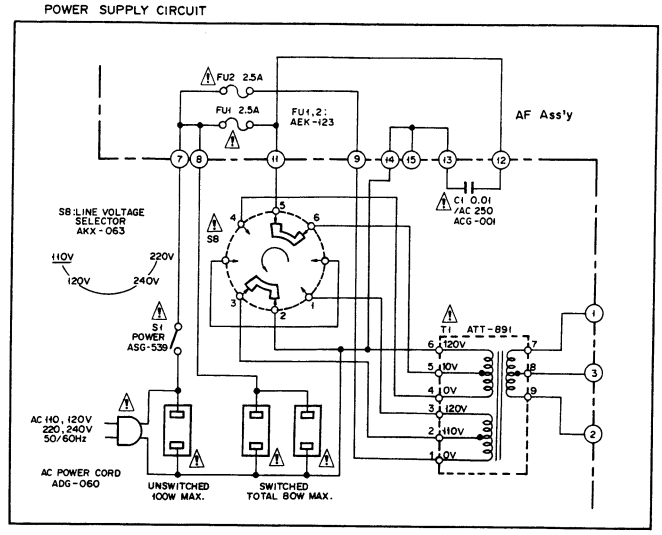
For HEZ type


TAPE 2 / ADAPTOR
PHONO
TUNER
AUX / VIDEO
TAPE 1
REC
PLAY
PHONES
SP-B
SP-A
R CH
L CH
S2 SPEAKERS
OFF-A-B-A+B
Q1 NJM4558DX
Q2,3 PA400B
Q4 2SD880
Q5 2SD438
Q6 2SB560
Q7,8 2SA798
Q9,10 2SC1645
Q11,12 2SA1145
Q13,14 2SC2705
Q15,16 2SC2275
Q17,18 2SA985
Q19,20 2SC945A
Q21 2SD438
Q22,23 2SC945A
D1,2 1S1555
D3,4 STV3H
D5 1S1554
D6~8 WZ-157
D9,10 10E2
D11~14 SR3AM-4
D15 XZ-132
D16~19 WZ-056
D20~23 1S1554
Power Tr.
TP.1
TP.2
TP.3
TP.4
FU1 T 2A
FU2 T2.5A

SA-930/S, S/G, YP, HE and HB types are the same as the SA-930/KU type except for following sections.

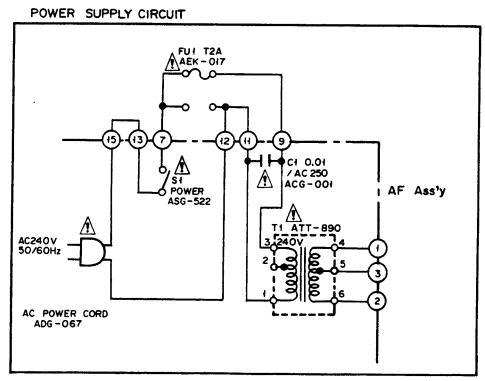
For S, S/G types

POWER SUPPLY CIRCUIT



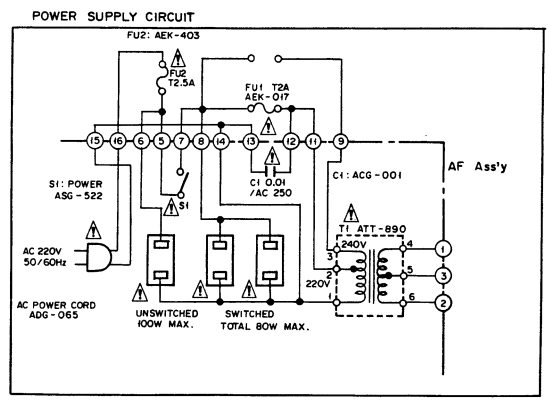
For YP type

POWER SUPPLY CIRCUIT



For HE type

POWER SUPPLY CIRCUIT



For HB type

POWER SUPPLY CIRCUIT